



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 2  
DESA/HWSB/HWSS  
2890, Woodbridge Avenue, Edison, NJ 08837

## **EXECUTIVE NARRATIVE**

**Case No.:** 48579

**Site:** Pierson's Creek

**Number of Samples:** 13 Water, (w/ 1 RB, 1 FD)

**Analysis:** Cyanide, CN (Spectrophotometry)

**SDG No.:** MBFQS8

**Laboratory:** Bonner Analytical Testing Co (BON)

**Sampling date:** 12/05,06/2019

**Validation SOP:** HW-3c (Rev 1)

### **QAPP**

**Contractor:** CDM Smith

**Reference:** 3323-060-03778 (February 14, 2019)

### **SUMMARY OF DEFINITIONS:**

**Critical:** Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified "R" rejected.

**Major:** A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified "J" estimated, "J+", and "J-" represent likely direction of the bias.

**Minor:** The level of uncertainty is acceptable. No significant bias in the data was observed.

**Critical Findings:** Samples have analyte that has been qualified "R" due to exceeding holding time criteria.

**Major Findings:** Samples have analyte that has been qualified "J-".

**Minor Findings:** Cyanide in samples has been qualified "J" due to results between MDL and CRQ.

**COMMENT:** Detected target analyte, Cyanide (CN) exceeded the project action levels for one or more samples.

**Reviewer Name(s):** A. Aoanan (SEE)

**Approver's Signature:**

**Date:** 02/05/2020

**Name:** Narendra Kumar

**Affiliation:** USEPA/R2/HWSB/HWSS



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**Data Qualifier Definitions (National Functional Guidelines)**

Qualifier Symbol	Explanation		
	INORGANICS	ORGANICS	CHLORINATED DIOXINS/FURANS
<b>U</b>	The analyte was analyzed for but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
<b>J</b>	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL).	The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
<b>J+</b>	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
<b>J-</b>	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
<b>UJ</b>	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
<b>R</b>	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
<b>N</b>		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".	
<b>NJ</b>		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
<b>C</b>		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
<b>X</b>		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	



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## DATA ASSESSMENT

### ANALYSIS: CYANIDE

The current SOP HW-3c (Rev 1) September 2016, USEPA Region II for the evaluation of Cyanide generated through Statement of Work ISOM02.2, and any future editorial revisions of ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi- Automated Screening Results Report.

#### 1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time, pH (aqueous samples), or cooler temperature are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (14 days) and pH ( $\geq 12$ ) have not been met, will be qualified as estimated, "J"; the non-detects (sample quantitation limits) will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

The following samples exceeded technical holding time. Detects are qualified as estimated **J**. Nondetects are qualified as unusable **R**.

**Cyanide** – MBFQS8, MBFQS9, MBFQT4, MBFQT5, MBFQT6, MBFQT7, MBFQT8, MBFQW7, MBFQW8, MBFQX0, MBFQX1, MBFQX7, MBFR92

No other problems were found for this criterion.

#### 2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for cyanide. Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

##### A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be employed to establish the analytical curve. At least one of the calibration standards shall be at or below the Contract Required Quantitation Limit (CRQL). The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The calibration curve for cyanide shall possess a correlation coefficient of  $\geq 0.995$  to ensure the linearity over the calibrated range. The percent differences calculated for all of the non-zero standards must be within  $\pm 30\%$  of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.



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No problems were found for this criterion.

## B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for cyanide by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every hour during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample. The percent recovery acceptable limits for ICV/CCV are 85 – 115%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

## 3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **ICB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

**Cyanide** – MBFQW7, MBFQW8, MBFQX0, MBFQX1, MBFQX7

**FIELD / EQUIPMENT / RINSE BLANK** – MBFQX7 (RB-3-GW)

Equipment Rinse Blank (**E/RB**) sample identified in the sampling date(s) Trip Report was included in this **SDG**.

No other problems were found for this criterion.

## 4. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is  $\geq 4x$  the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

## 5. DUPLICATE SAMPLE ANALYSIS



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The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35% for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values  $\geq$  five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is  $< 5x$  the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

## 6. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values  $\geq$  five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the 2x the CRQL shall be used if either the sample or duplicate value is  $< 5x$  the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

Field Duplicate (FD) samples were identified in the Trip Report for this SDG's sampling dates.

**Duplicate Pair** – MBFQX0 (T17-SW-R2), original) and MBFR92 (T917-SW-R2, duplicate)

No problems were found for this criterion.

## 7. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion. Not applicable.

## 11. OTHER ISSUES

No other issues were found for this SDG.

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQS8	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: TMW-21	pH: 12.	Sample Date: 12/05/2019	Sample Time: 10:10:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	14.7	J-	ug/L	14.7		1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQS9	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: TMW-22	pH: 12.	Sample Date: 12/05/2019	Sample Time: 10:10:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	18.2	J-	ug/L	18.2		1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQT4	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: D5	pH: 12.	Sample Date: 12/05/2019	Sample Time: 12:30:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	14.4	J-	ug/L	14.4		1	YES	S3VEM



# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQT5	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: D7	pH: 12.	Sample Date: 12/05/2019	Sample Time: 11:05:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	14.7	J-	ug/L	14.7		1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQT6	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: D9	pH: 12.	Sample Date: 12/06/2019	Sample Time: 08:50:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	15.2	J-	ug/L	15.2		1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQT7	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: D11	pH: 12.	Sample Date: 12/06/2019	Sample Time: 09:50:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	R	ug/L	10.0	U	1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQT8	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: D13	pH: 12.	Sample Date: 12/06/2019	Sample Time: 10:10:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	R	ug/L	10.0	U	1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQW7	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: T14	pH: 12.	Sample Date: 12/05/2019	Sample Time: 11:35:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	UJ	ug/L	5.1	J	1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQW8	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: T15	pH: 12.	Sample Date: 12/05/2019	Sample Time: 09:20:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	UJ	ug/L	6.3	J	1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project

GroupID: 48579/EPW14029/MBFQS8

Lab Name: Bonner Analytical Testing Co.

Sample Number: MBFQW8D	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH: 12.	Sample Date: 12/05/2019	Sample Time: 09:20:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	7.3	J	ug/L	7.3	J	1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQW8S	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH: 12.	Sample Date: 12/05/2019	Sample Time: 09:20:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Spike	97.8		ug/L	97.8		1	YES	S3VEM



# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFQX0	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: T17	pH: 12.	Sample Date: 12/06/2019	Sample Time: 11:35:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	UJ	ug/L	5.1	J	1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project

GroupID: 48579/EPW14029/MBFQS8

Lab Name: Bonner Analytical Testing Co.

Sample Number: MBFQX1	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: T19	pH: 12.	Sample Date: 12/06/2019	Sample Time: 11:20:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	UJ	ug/L	7.1	J	1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project

GroupID: 48579/EPW14029/MBFQS8

Lab Name: Bonner Analytical Testing Co.

Sample Number: MBFQX7	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: Rinsate Blank	pH: 12.	Sample Date: 12/05/2019	Sample Time: 15:00:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	UJ	ug/L	4.9	J	1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: MBFR92	Method: Cyanide	Matrix: Water	MA Number:
Sample Location: T17	pH: 12.	Sample Date: 12/06/2019	Sample Time: 11:35:00
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	R	ug/L	10.0	U	1	YES	S3VEM

# Sample Summary Report

Project Name: PIERSON'S CREEK Project	GroupID: 48579/EPW14029/MBFQS8	Lab Name: Bonner Analytical Testing Co.
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Sample Number: PBW01	Method: Cyanide	Matrix: Water	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids:	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	10.0	U	ug/L	10.0	U	1	YES	S3VEM

# Sample Summary Report

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Project Name: PIERSON'S CREEK Project

GroupID: 48579/EPW14029/MBFQS8

Lab Name: Bonner Analytical Testing Co.

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